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situation fairly and frankly, and, with the pugnacious confidence of an abounding vitality, resolves to play the game well and without grumbling, striving always to make of life a work of art, and remembering that not he who knows most and thinks most is happiest, but rather he that *lives* most. The prosaic conclusion of good sense is, we are told, "that as everybody has to play the part set for him by nature and circumstances in a drama of mixed tragedy and comedy, of which he neither knows the beginning nor can foresee the end, and has done with it and is himself done with when his part is played, he ought not to take himself and the business too seriously, but should make up his mind quietly to act it to the best of his ability with all the goodwill and good humor he can command. Bad humor or overmuch self-consciousness will only fret and hurt himself and spoil the play," as will also too much insistence upon austere duty and that unbalanced view which regards ideals as patterns to which actual conduct may conform.

To criticize the underlying philosophy of this book is not the purpose of this review. Such criticism would itself be largely the expression of another system of philosophic opinion. Nor can any review pretend to do adequate justice to the many-sided aspects of the author's reflections, to the vigor and incisiveness of his thought and statement, and to his unflinching utterance of the truth as he sees it. As a thoroughgoing and consistent application of the naturalistic point of view to the manifold facts of life, the volume is to be heartily welcomed and commended. Every one who loves to reflect upon life should dip into its pages. The cynically inclined will find there much to please him, the cut-and-dried idealist will be irritated at every turn, and only he who does no thinking at all will remain cold and untouched.

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Development and Evolution. By JAMES MARK BALDWIN. New York, The Macmillan Company, 1902.—pp. xvi, 395.

The theory of evolution enjoys the unique distinction of being at once the most important and the most ambiguous of modern scientific hypotheses. To doubt that slow ancestral evolution is in some way responsible for the various forms of organic life which we see about us, has long been to put oneself outside the pale of conventional scientific respectability. But when the interested inquirer seeks for some precise account of the manner in which organisms undergo modifications in their structure, and much more when he attempts to ascertain the exact mode in which heredity operates, he finds himself confronted with a perfect jungle of divergent opinion. Recent biological writing on these subjects has served to clarify the issues at stake, but the household of organic science is still far from being at peace with itself.

The striking book before us affords an interesting and representative exposition of a tendency which has been regaining in scientific repute a position that for a generation past has often been denied it. Indeed, the extremer advocates of physico-chemical biology *et id omne genus* still view it with undisguised contempt. The tendency referred to involves the introduction of consciousness as a factor of fundamental moment in the explanation of genetic phenomena. So important is the rôle which Mr. Baldwin seems disposed to assign it, that it promises to furnish a means through which the most radical differences of Darwinian and Lamarckian may be converted into amicable harmony—provided, of course, that the Lamarckian is willing, for it must be confessed that he is harmonized largely by absorption, a process he may resent.

Moreover, Mr. Baldwin's book offers another significant exemplification of current biological conditions in its extensive drafts upon philosophy. To many a scientific man it must seem an evil day when the fair raiment of science is disfigured with the tawdry pretensions of metaphysics. For better or for worse, however, biology appears to be entering upon a period of fresh synthetic effort, and all thoroughgoing synthesis is doomed to a measure of invasion by the philosophy of its own day. We shall make the grounds of this fact clearer as it bears on the present case a little further on.

The cardinal tenet in Mr. Baldwin's evolutionary creed,—a creed which is largely shared, be it said, both in content and originality of formulation by Messrs. Lloyd Morgan and Osborn,—may be put thus: By a process of preservative individual accommodation involving consciousness, single organisms keep themselves alive in times of danger, and thus secure the accumulation in successive generations of the variations which they may chance to represent. In this way useful structures and functions, *e. g.*, instincts, gain time to mature, even though during the period of their development they may not have been useful. Through the destruction by natural selection of all harmful variations, the resulting effects would have at first sight all the appearance of a 'use-inheritance' origin of Lamarckian type, whereas, in point of fact, there may have been no real transmission of acquired characteristics at all. The important group of social and gregarious influences (imitation, tradition, etc.), by means of which young creatures are guided by their elders, would also contribute to achieve the same outcome. The chief corollary of this principle is found in the theory of pleasure-pain factors acting upon the accommodatory movements of adaptation. Mr. Baldwin's formula runs somewhat as follows: Painful stimulations produce movements of retraction and restriction; pleasurable stimulations, on the other hand, occasion profuse expansive movements. Out of the matrix of overproduced movements brought about by pleasurable stimuli, the organism selects the particular co-ordinations relevant to the special situation to be met. These movements persist rather than others primarily because they are agreeable, and because all such reactions tend by virtue of the very constitution of the organism to reinstate themselves, so long as they are agreeable.

Stated in its most general form, 'organic' selection, as Mr. Baldwin calls his active principle, appears to offer an exceedingly sensible and plausible account of one stage in the operation of natural selection. It thus becomes a subordinate chapter in the whole statement of evolutionary process from the natural selection point of view. It contains a more precise description of the early stages in the acquirement of modifications (ontogenetic) and variations (phylogenetic, congenital) than had before been clearly articulated. For those who accept the genuineness of sexual selection, organic selection must constitute a similar but more general category, inasmuch as it involves consciousness in *all* of its directions of expression, whereas sexual selection involves only *one* of its modes of activity. Such a theory seems almost truistic once it is propounded, and yet it is undoubtedly of conspicuous value in unifying the discrepant forms of interpretation advanced by different biologists for certain groups of facts. To the Lamarckian who bases his faith either upon alleged instances of inheritance of acquired characteristics, or upon the asserted impossibility of explaining by the destructive action of natural selection the evolution of structures and functions which were useless up to the time of their complete development, the theory offers an alternative hypothesis showing how the semblance of transmission of acquired characters may arise from the cumulation of modifications in organisms whose adaptive reactions enabled them to live and beget offspring during the period in which these modifications (originally useless, perhaps) were becoming established. To the Darwinian, on the other hand, who has been wont to lay all the stress upon the controlling influence of natural selection in weeding out the unfit, such a theory invites a redistribution of emphasis, by exhibiting the primary value of individual adaptations, through which many variations may have become permanent that otherwise would have been ruthlessly stamped out. When phrased in this way, it is hard to conceive that any serious criticism should be directed against the hypothesis, save by those who wish to couch the whole series of developmental and evolutionary processes in totally different terms, *e. g.*, physico-chemical reactions. To such persons natural selection is itself an abomination. There is, however, one phase of the theory to which further attention should be directed.

All is clear sailing so long as one contents oneself with the mere statement that organisms do in some manner accommodate themselves to the rigors of their peculiar environments, thus succeeding in surviving and secondarily succeeding in assisting the crystallization of useful variations. Such a statement is, like that of natural selection itself, simply a formulation of the general method by which certain results have been attained; not an analytical apportionment of causal responsibility to specific factors in the process. But when one introduces consciousness into one's explanatory system explicitly to account for the execution of accommodatory movements, and especially when one attempts to sketch the details of the operation in terms of pleasure-pain phenomena, the dangers of scientific and philosophic shipwreck are immensely enhanced. Needless to say, Mr. Baldwin is thoroughly alive to this danger. He faces it without flinching, and his position deserves notice. It may be remarked in passing, that the whole range of evolutionary processes in plant life falls outside the limits of such a formulation as that of our author, unless one adopts the precarious hypothesis that plants are conscious.

Mr. Baldwin is what may be styled a 'scientific parallelist' (if he will pardon this gratuitous distribution of titles) and a 'philosophic monist' of the 'double aspect theory' variety. By which is meant that he accords to both the psychical and the physiological series of events in an organism the possibility—and for certain scientific purposes the necessity—of separate treatment. He would evidently countenance the validity of the mechanical categories in the physical series, so far as one might be consulting the interests of exact science. In the psychical series, however, another type of category holds sway. When he comes to such a question as that raised by the evolutionary hypothesis, *i. e.*, How has the psychophysical organism come to be what it is? he passes on to his monistic position, in which he maintains that neither the psychical nor the physical phase of our organic entity can be neglected to the cost of the other, and that the categories appropriate to the one cannot be set up as absolute to the prejudice of those appropriate to the other. As a philosophic point of view, this position has, of course, an honorable ancestry. But there have always been carping critics who have insisted that the standpoint simply represented an attempt in philosophic speculation to run with the hare and course with the hounds. The question here, therefore, is as to the relevancy of this criticism, which clearly has an important bearing on Mr. Baldwin's point of view. If the theory of organic selection requires even occasionally the assistance of consciousness to make it work, one is at once confronted with the task of showing how consciousness succeeds in producing causal changes in the physical world of muscles; for if it does not produce such changes, it is evidently futile to cite it at all in connection with explanations supposedly based upon physical causation. That Mr. Baldwin does not mean to blink the issue is shown by the following words: "The fact of accommodation requires on the part of the individual organism something equivalent to what we call consciousness in ourselves" (p. 121).

Now I do not understand that, in his setting forth of the case, Mr. Baldwin means to go further than the utterance of a hope that somehow or other a point of view may be worked out in accordance with which it shall be found tenable to countenance in a vital way the immediate implications of the deliverances of consciousness, concerning the reality of the control which our minds exercise over our movements, and at the same time to adhere without shuffling to the conclusions of physical science in its treatment of causal and mechanical relations,as these bear upon the operations of the neuro-muscular processes. At all events, he says in one place: "And it is the problem of the metaphysics of experience to find the broader category, the final principle of experience as a whole, both objective and subjective. This I do not care to discuss," etc., etc. (pp. 130, 131).

Apparently, then, the recognition that consciousness plays an important part in organic evolution must for the present remain a relatively unilluminating postulate. For it can only be efficient for some large view in which are harmoniously included the rights of both the mechanical and the non-mechanical categories. Until biologists are ready to write the history of evolution in the terms of this larger view (*e. g.*, the "æsthonomic idealism" of a recent article by Mr. Baldwin) instead of in those of the natural science and causation view, all references to efficient factors of the conscious kind must inevitably involve contradiction. One cannot, of course, impute to Mr. Baldwin responsibility for this situation, but it certainly constitutes a serious limitation of the significance for contemporary biology of his formulation of organic selection. The rank and file of biologists insist on attempting to find their real explanations in the physiological series of events where *physical* causation presumptively holds sole sway. This may indicate a narrow and unphilosophic provincialism of mind on their part, but it is at present the uncontrovertible fact, a fact rendered more conspicuous by an occasional illustrious exception. For example, one learned American biologist has recently said that "consciousness stands in immediate causal relation with physiological processes."

Psychologists have for a long time consciously faced this difficulty, but it does not appear to have taken an important place among the puzzles of biological theory until very recently. It is not to the reviewer's mind at all obvious that the difficulty need be raised, so far as concerns the value of organic selection. Let it be granted that in some way (frankly we do not know just how, Mr. Baldwin nor the rest of us) organisms do make accommodatory movements, which serve to tide them over times of environmental menace, until useful modifications have become firmly established. Let it be also admitted that consciousness is in some manner concerned in these operations. The effort to determine its exact place may well be postponed until "æsthonomic idealism," or some other equally mellifluous 'ism,' is generally accepted as cosmic theory. In the interim we shall be just as far ahead for all essential purposes of scientific theory, and we shall have been spared much needless wrangling. Moreover, even on Mr. Baldwin's own showing, "æsthonomic idealism" does not for a moment exonerate us from the necessity of finding the physiological counterparts of the conscious processes concerned in the selection of adaptive movements.

When one comes to Mr. Baldwin's account of the mode in which pleasure and pain influence the selection of movements, one opens up a more purely psychological question than those previously adverted to, and one which has already been treated in a similar manner in the author's preceding works. The formula baldly stated is this: Pain, depression, cessation of movements; pleasure, expansion, profusion of movements; selection and continuation of useful reactions. To my mind there are probably essential fallacies in this position, despite the wide endorsement among psychologists of several of the premises upon which it rests. In the first place, there is an erroneous estimate of the motor values attaching respectively to pleasure and pain psychoses. Pain is by no means to be described merely in terms of depression and constriction. A view which does this cannot rest upon ordinary introspection, but must look for its support to the alleged effect of pain upon the circulatory and respiratory movements, and upon the tonus of the voluntary muscles under certain experimental conditions. These conditions are by no means immediately comparable with normal circumstances. One of the first and most persistent effects of pain is a violent motor overflow, directed, it is true, to escape from the stimulus, but resulting none the less on that account in the production of movements which may readily furnish a basis for subsequent useful coördinations of protection and flight. Surely the singed cat that dreads the fire has acquired a useful coördination from excess movements that were not called out by any thrills of pleasure. Moreover, the unpleasantness connected with effortful activity seems to be given scant justice in such a statement as that which Mr. Baldwin propounds. Indeed, the theory is classic, even if not popular, which looks to pain as the prime mover in human affairs. On the other hand, pleasure is by no means the invariable antecedent of overproduced movements. Many pleasures are distinctly narcotizing in their immediate effects. In Mr. Baldwin's statements about pleasure and pain, there appears to be a confusion between the *ultimate* effects of these psychical elements upon motor power, and their *immediate* effects upon the profusion of movements which they occasion. Though it should be admitted that all pain is at once followed by depressed vitality, and all pleasure by increased vitality, it would not necessarily follow, and, indeed, it is not true, that all pain produces immediate decrease of movement and all pleasure increase. The contrary is surely much the more frequent and more immediate result, and it is the immediate consequences which are of crucial importance in leading to the establishment of useful reactions. It will be seen that I call in question simply the *modus operandi* of pleasure and pain in Mr. Baldwin's description. The importance of the affective factors I do not doubt, but his analysis of their operation seems to me precisely to invert certain relations.

A final point which requires notice, and to which the last chapter of Mr. Baldwin's book is devoted, is the development of a theory of genetic modes, a heading under which the author indulges his readers in a dash through wide fields of metaphysics. The problem treated is an old one; but Mr. Baldwin, as is his wont, has touched it in an extremely fresh and suggestive manner, and it is sincerely to be hoped that he will at an early date elaborate it more fully. As it stands now, the doctrine is somewhat puzzling both to expounder and critic. One hesitates to put it briefly lest one distort it. Nevertheless, acknowledging this risk, a few sentences must be given to it. Negatively, it is a vigorous protest against the unwarranted advocacy of the purely mechanical and chemical categories as complete and adequate media for the explanation and appreciation of vital phenomena. It is also a protest, eminently sane in its contentions, against the loose and inaccurate extensions of analogy from one stage to another of life processes, save when an examination of each series concerned may have shown the analogy just. Positively, the theory assigns to "agenetic science" the securing of exact quantitative formulæ descriptive of phenomena in convertible propositions. Thus, $A = B$, and $B = A$. In all truly genetic science, on the other hand, descriptive formulæ are never reversible. The product of any genetic series at any stage of its development always contains something unique which was not previously in the series. The author says: "Genetically $A = B$, but it does not follow that $B = A$" (p. 303). Again, "that series of events only is truly genetic which can not be constructed before it has happened, and which cannot be exhausted by reading backwards after it has happened" (p. 311). "In the life processes there seems to be a real genetic series, an irreversible series. Each stage exhibits a new form of organization" (p. 330). From Mr. Baldwin's point of view, history as well as biology is a genetic science. One cannot employ exact science for prediction (even theoretically), but after historical events have occurred they should, according to our author, be capable of formulation in the terms of exact science.

So far as Mr. Baldwin is attempting to curb the overweening pride of the prophets of a physico-chemical philosophy of life, he will find sympathizers in plenty. Whether the method which he proposes can finally be accepted, it will hardly be possible to say until the doctrine is more fully developed. Take, for example, his expressions about reversibility. If the irreversibility of vital phenomena refers to the mere conceivability of a given order, then the contention is obviously false. If it refers to causal relations of any kind, then it is true of all series, inorganic as well as organic, and the distinction becomes useless. Mr. Baldwin will have to make his peace with Kant, Royce, and others for the liberties he takes—as I understand him—with irreversibility. Moreover, it is not clear in what sense a genetic series produces results which are *unique* in any way which is not equally true of inorganic processes. Surely the distinction here is not so obviously one of uniqueness in the product, as it is one resting upon the degree of our ability to control the producing factors. If we once know what the series of fission processes are by which a cell divides, we are just as sure how the divisions will occur under given conditions, as we are that $H_2 + O$ will give water. We have to find out both facts experientially to start with, and both are novel then and never so again. However all this may be, Mr. Baldwin's pronunciamento will, in its negative aspects at least, undoubtedly have a salutary influence upon the discussions at present going forward.

It has now been sufficiently illustrated what was meant by saying at the outset that a synthetic era in biology must necessarily involve a measure of philosophy. Biologists find, in bringing together all the lines of evidence bearing upon evolution, the great synthetic hypothesis, that they must define the scope of the principles with which they work, *e. g.*, causation, mechanism, teleology, etc. The problems of heredity, variation, selection, and the like, inevitably involve these categories. Moreover, consciousness must at least be recognized, and so the psychologist is called in and given respectful attention. Mr. Baldwin's book is an admirable example of this convergence of scientific and philosophic interests, and the biologist must acknowledge his obligation for the forceful way in which these matters outside his own sphere have been laid before him.

Of the nineteen chapters in the present volume, eleven are reprints, with more or less of change, from articles previously published. In addition to the seven new chapters, in which the most important material deals with psychology and its relations to biology, including the chapter on genetic modes, Mr. Baldwin submits in appendices a list of admirable discussions upon organic selection and its near relatives by Osborn, Lloyd Morgan, Poulton, Headley, Conn, and himself.

Although the book inevitably suffers somewhat from its mode of construction, it is nevertheless, in the reviewer's opinion, much the most lucid and vigorous of the series to which it belongs. Despite a certain measure of repetition, there are almost none of the annoying cross references to the author's other works of which reviewers of his previous books have so often complained. One may think the argument good, bad, or indifferent; but at all events it is straightforward and ready to rest upon its own merits. The shortcoming which the lay reader most often feels, is the lack of richer illustrative material. In its place one finds a strong disposition to "logical disquisition," as Mr. Baldwin calls it, when criticising Romanes for a similar sin. Such a defect is, perhaps, unavoidable when a scientist steps outside his own specialty, and it should be said in fairness that Mr. Baldwin makes no pretense of biological proficiency. Taken together, *Mental Development*, *Social and Ethical Interpretations*, and *Development* *and Evolution* constitute a masterly exposition of genetic processes which will long remain a starting point for future explorers.

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The Life, Unpublished Letters, and Philosophical Regimen of Anthony, Earl of Shaftesbury (Author of the 'Characteristics'). Edited by BENJAMIN RAND. London, Swan Sonnenschein & Co.; New York, The Macmillan Co., 1900.—pp. xxxi, 535.

In his 'Prefatory Introduction,' the editor gives due credit for the idea of the present volume. He refers to the remark made by Professor Fowler, at the beginning of his well-known book on Shaftesbury and Hutcheson ('English Philosophers' Series), that the Shaftesbury Papers, now deposited in the Record Office at London, would well repay a more careful investigation than he was able to give them in the preparation of his own book, which was written for a popular series. As a result, we have a thick, well-printed volume, consisting of a sketch of the philosopher's life by his son, the Fourth Earl of Shaftesbury, of the unpublished letters, and of a philosophical work, hitherto unpublished, to which the editor has given the not wholly fortunate name *Philosophical Regimen.*

Of the material thus brought together, the life is perhaps the least unfamiliar, since its contents were mainly printed by Thomas Birch in the *General Dictionary* (1734–41) of Bayle, without due acknowledgment of their source, though apparently by permission. "But," as the editor characteristically remarks, "this is the first time for the Life to be published under the name of its real author, and with the exception of a necessary change in the order of paragraphs to conform with known events, almost precisely as it exists in the original manuscript. . . . Its publication here affords in a compact and narrative form the various events in his career necessary to be known by the reader in order to obtain a clear and ready understanding of the contents of the letters which immediately follow in the work" (pp. v, vi). It is only fair to remark that the editor's task seems to have been performed mere efficiently, on the whole, than this and other bungling statements would lead one to expect, though certain cases of editorial carelessness are not difficult to detect. For example, the first and second paragraphs of the Life, as here printed, would be rather confusing to a reader who had not been prepared by the editor himself, in such statements as the above, to do his share of the editorial work. The first paragraph begins: "The following sketch of my